

Notes 2/12 - Modeling with Exponentials

$$f(x) = a \cdot b^x$$

x ← when / how many times
initial amount ← a
what's happening to the initial amount ← b

Percent Growth or Decay

■ Growth $b > 1$ "appreciate" 100% + % growth

■ Decay $0 < b < 1$ "depreciate" 100% - % decay

* Always start from 100% then add or subtract your % growth or decay

* Always turn your % into a decimal
↳ divide by 100 / Move the decimal two spaces to the left

Ex 1: A house worth \$120,000 is depreciating in value 6% each year.

A. Write an equation to model the situation.

B. How much will the house be worth in 10 years?

A. $a = 120,000$ $b = 100\% - 6\% = 94\% \Rightarrow 0.94$

$$f(x) = 120,000 (0.94)^x$$

where x represents the # of years

B. $f(10) = 120,000 (0.94)^{10}$
 $= \$64,633.81$

Ex 2: A pet store starts with 10 fish that double in population every 4 months.

How many fish will they have after a year?

$$f(t) = 10(2)^{\frac{t}{4}}$$

$$f(12) = 10(2)^{\frac{12}{4}}$$

12 months in
1 year

$$= 10(2)^3 = 80 \text{ fish}$$